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ABSTRACT

This study examined age and sex differences in young children's skills in decoding nonverbal facial cues of emotional states. The purpose was threefold: (1) to determine whether older preschoolers were better decoders than younger preschoolers; (2) to see whether sex differences would be apparent throughout the preschool period or emerge only among older preschoolers; and (3) to test the hypothesis that male and female children are differentially sensitive to certain emotional cues. A total of 67 children 4 through 6 years of age from three preschool classes were shown six slides each of happy, angry, sad, surprise, afraid, and disgust expressions. Children's skills improved with age. Sex differences in the pattern of skills for the six emotions were present at all ages, although they were significant only in the youngest group. The pattern of improvement across ages in decoding skills differed for each sex. (Author/RH)

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Decoding Nonverbal Cues of Emotion: Emergence of Sex Differences

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ABSTRACT

This study examined age and sex differences in young children's skills in decoding nonverbal facial cues of emotional states. The purpose was threefold: First, to determine whether older preschoolers were better decoders than younger preschoolers. Secondly, to see whether sex differences would be apparent throughout the preschool period, or emerge only with older preschoolers as reported for encoding skills. A third interest was to test the hypothesis that male and female children are differentially sensitive to certain emotional cues. Sixty-seven children, ages 4-6 years, from three preschool classes were shown six slides each of happy, angry, sad, surprise, afraid, and disgust expressions. Children's skills improved with age and sex differences in the pattern of skills for the six emotions were present at all ages, although they were significant only in the youngest group. The pattern of improvement across ages in decoding skills differed for each sex.

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This study concerns the development of young children's skills in decoding (interpreting) nonverbal facial cues of emotional states, and the emergence of sex differences. Previous research documents that skills in decoding nonverbal cues increase linearly from elementary school until they level off in young adulthood (Rosenthal, Hall, DiMatteo, Rogers & Archer, 1979). Sex differences have been found in all age groups (Hall, 1978, 1979). Few studies, however, have been conducted with preschoolers, and those that have studied children have focused on their encoding (sending) skills (e.g., Buck, 1977; Zuckerman & Przewuzman, 1979). Interestingly, the latter studies found that females' encoding accuracy increased between ages 3-6 years, whereas males' accuracy decreased. These findings have been interpreted in terms of males' and females' acquisition of sex-typed "display" rules for emotional cues (Ekman & Friesen, 1975). In other words, as boys learn that males in our society do not show their feelings, their performance on encoding tasks will deteriorate. On the other hand, as females are socialized to express their feelings, their performance on encoding tasks will improve. One implication of the display-rules argument is that sex differences should be most apparent when an encoding task taps the natural "performance", rather than the "competence", aspect of nonverbal expressive skills. In support of this thesis, Fujita, Harper and Wiens (1980) found that adult females were superior encoders when reacting spontaneously to stimulus slides, but not when subjects were asked to enact emotional expressions.

Information is also needed on age and sex differences in preschoolers' decoding skills as it will affect both our explanations of sex differences in nonverbal skills, as well as the direction of research aimed at unravelling how

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children develop these skills. It was hypothesized that older children would be better decoders than younger ones, and that females would be better decoders than males, especially in the older group.

A second interest concerned whether male and female children are differentially sensitive to certain emotional cues. Unfortunately, most researchers have examined only subjects' total accuracy scores on encoding and decoding tasks summed across different emotions. An encoding study that individually analyzed college students' abilities with different emotions found that females were better than males on all six emotions studied (Friedman, Riggio, & Segall, 1980). On the other hand, a study that examined hemispheric differences in perceiving facial expressions (Haviland & Ingate, 1980) found that female college students were "perceptually vigilant" for distress expressions while males were sensitive to angry expressions. If children's sensitivity to emotional expressions is affected by sex-role socialization, we would expect that boys and girls should do equally well with happy and surprise faces, but that sex differences might emerge for sad, angry, and afraid faces. A third hypothesis was that females would be more sensitive to sad and afraid expressions, while males would be more sensitive to angry expressions.

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METHOD

Subjects were 67 preschoolers from three classrooms at the college's early childhood development center. There were 12 females and 12 males in the young four's (X = 4 yr., 2 mon.), 12 females and 12 males in the older four's (X = 4 yr., 9 mon.), and 10 females and 9 males in the kindergarten group (X = 5 yr., 7 mon.). Sixty-one of the children were Caucasian, four were Asian, and two were Indian.

The decoding task was composed of 36 black and white slides of male and female adults' posed facial expressions taken from Ekman & Friesen's (1975) photos. These photos were used because their validity and reliability have been documented, and they have been standardized on a white, middle-class population. There were six slides each of happy, sad, angry, afraid, surprise, and disgust expressions. At the beginning of the testing session, the experimenter questioned each child to ensure that he or she was familiar with the six categories of emotional expressions and the names that we were using for the expressions. During testing, the subject was shown a slide and asked which of three emotions the person was feeling. The experimenter sat facing the subject with the slides projected on the wall behind her, and was unaware of which expression was shown. Subjects were randomly assigned one of five different orders of slides, with each emotion appearing an equal number of times among the answer alternatives. Testing took approximately 20 minutes per subject.

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RESULTS

Subject's errors for each category of emotions were summed, with a possible range of 0-6 errors per emotion. In addition, subjects' errors were examined to see whether they systematically or randomly confused one emotion with another. Friedman et al. (1980) found that adult subjects consistently confused each of the emotional expressions, except Sadness, with one other expression, and so awarded them credit for either response, e.g., if they answered either "Happy" or "Surprise" when the expression was Surprise. In this study the only consistent confusion was with Disgust expressions, which were misinterpreted as Angry expressions 20% of the time. Subjects received credit for correctly decoding Disgust expressions if they selected either "Disgust" or "Angry" from the answer alternatives.

The number of errors in each category of emotions was analyzed using MANOVA for unequal n, with between subject factors of age (3) and sex (2). There was a significant multivariate effect of age, $F(12, 110) = 3.13$, $p < .001$, using Wilks Lambda criteria, and significant univariate age effects for Sad, Afraid, Surprise and Disgust. There was also a significant multivariate age x sex interaction, $F(12, 110) = 2.42$, $p < .008$. The univariate interaction effect was significant only for the Sad expression, $p < .02$.

Multivariate analyses of the interaction revealed simple main effects of age for females and males, ps < .006 and .001, respectively. For the females, the univariate age effects were significant for Sad expressions, $p < .001$, while for males, the univariate age effects were significant for Happy, Afraid, Surprise, and Disgust, ps < .04, .04, .006, and .004, respectively. Inspection of the discriminant coefficients, listed in Table 1a, reveals that the age groups, within each sex, were distinguished best by their error scores on the following

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emotions: for Females, 1. Sad, 2. Angry, 3. Surprise, and 4. Happy; and for Males, 1. Surprise, 2. Disgust, 3. Happy, and 4. Afraid. The pattern of error scores across the three age groups on the six emotions is plotted separately for each sex in Figure 1.

There was also a multivariate simple effect of sex for the youngest age group, $p < .006$. The univariate effect was significant only for the Sad expression, $p < .007$. Inspection of the discriminant coefficients, listed in Table 1b, reveals that the youngest females and males were distinguished best by their scores on 1. Sad, 2. Angry, 3. Disgust, and 4. Afraid. The contrast in females' and males' scores on the Sad and Angry expressions was most responsible for this effect, as shown in Figure 2.

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DISCUSSION

The results support the first hypothesis of this study that children's decoding skills increase during the preschool period. Improvement was seen across the three age groups, although the improvement depended on the sex of the subject and the category of emotion. Contrary to the second hypothesis, sex differences did not appear in the older age group, as reported in studies of children's encoding skills. Instead, there were sex differences in the youngest age group due primarily to females' poorer performance with the sad expressions relative to males, and males' poorer performance with the angry, afraid, surprise, and disgust expressions.

One of the most important findings of the study was that the profile of children's decoding skills at each age and the pattern of skill development across ages depends on their sex. For example, females showed a dramatic improvement with age in decoding sad expressions, while males' performance stayed about the same. Females were also better decoders of afraid and surprise expressions with increasing age, while males improved in decoding surprise, disgust, and happy expressions. As predicted, in the two older groups females were better decoders of sad and afraid expressions while males were better decoders of angry expressions, yet these differences were not significant. Both males and females were most accurate with the happy and disgust expressions, and least accurate with the afraid expressions.

Future research should examine children's decoding skills separately for different emotional expressions, as the information obtained gives a more complete picture of developmental changes and sex differences than does the use of total accuracy scores. We also need longitudinal data if we are to

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accurately trace the emergence of sex differences in decoding abilities, and evaluate the influence of children's social milieu on their developing skills. Finally, we need studies to determine what it is about particular expressions that that make them easier or more difficult to interpret relative to the other expressions.

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Table 1a

Discriminant Coefficients for Multivariate Effects of Age within Sex

	Females	Males
Happy	.34	.54
Sad	-1.03	.32
Angry	.64	-.32
Afraid	-.09	-.37
Surprise	-.53	-.61
Disgust	-.01	-.57

Table 1b

Discriminant Coefficients for Multivariate Effects of Sex within the Youngest Age Group

Happy	.18
Sad	1.01
Angry	-.58
Afraid	-.36
Surprise	-.24
Disgust	-.41

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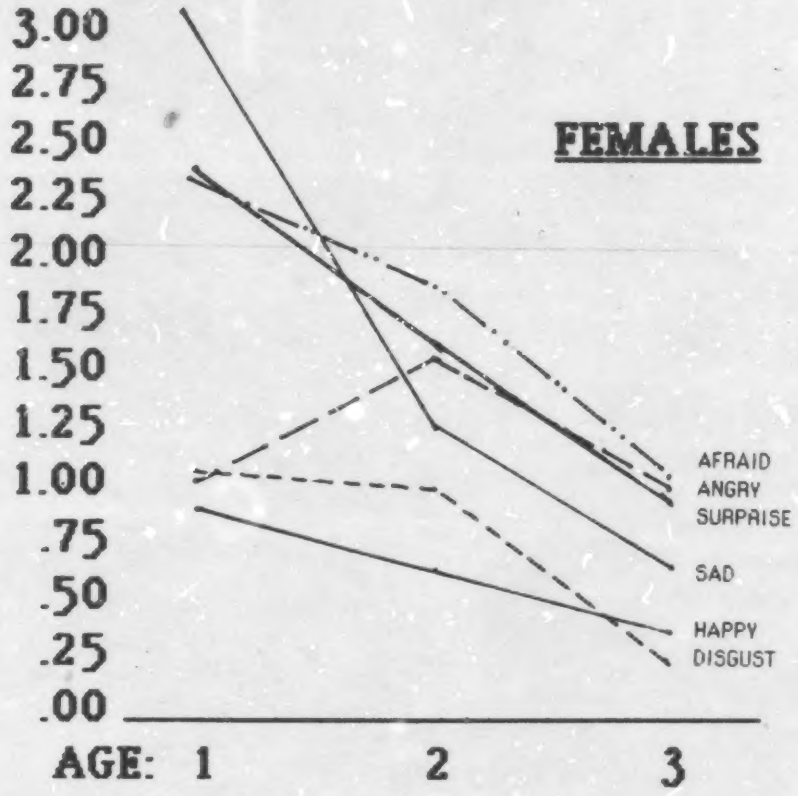
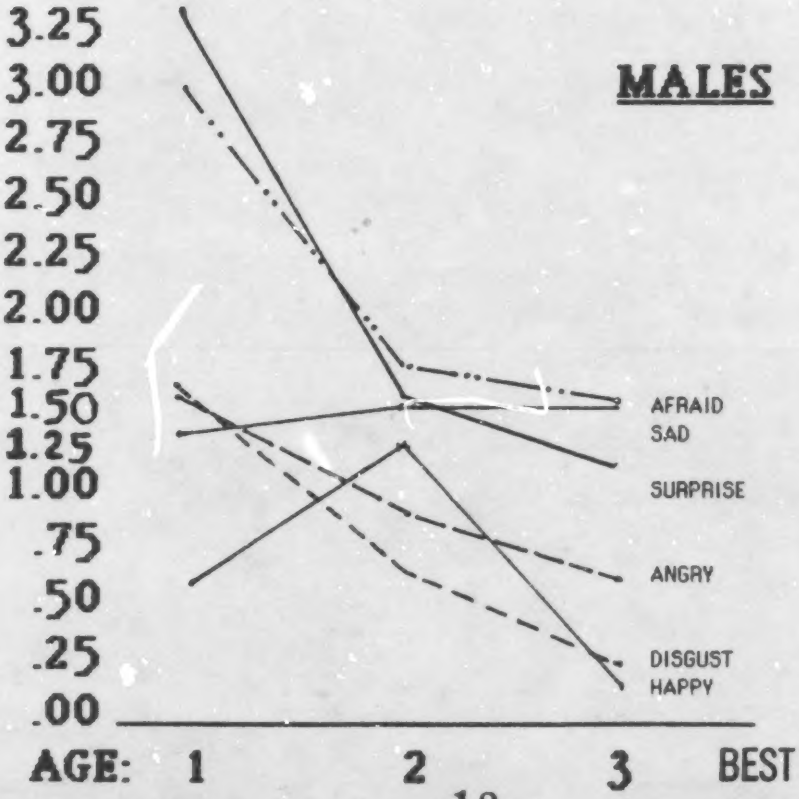
FIGURE 1 **Age Changes in Mean Error Scores of Six Emotions, by Sex.**





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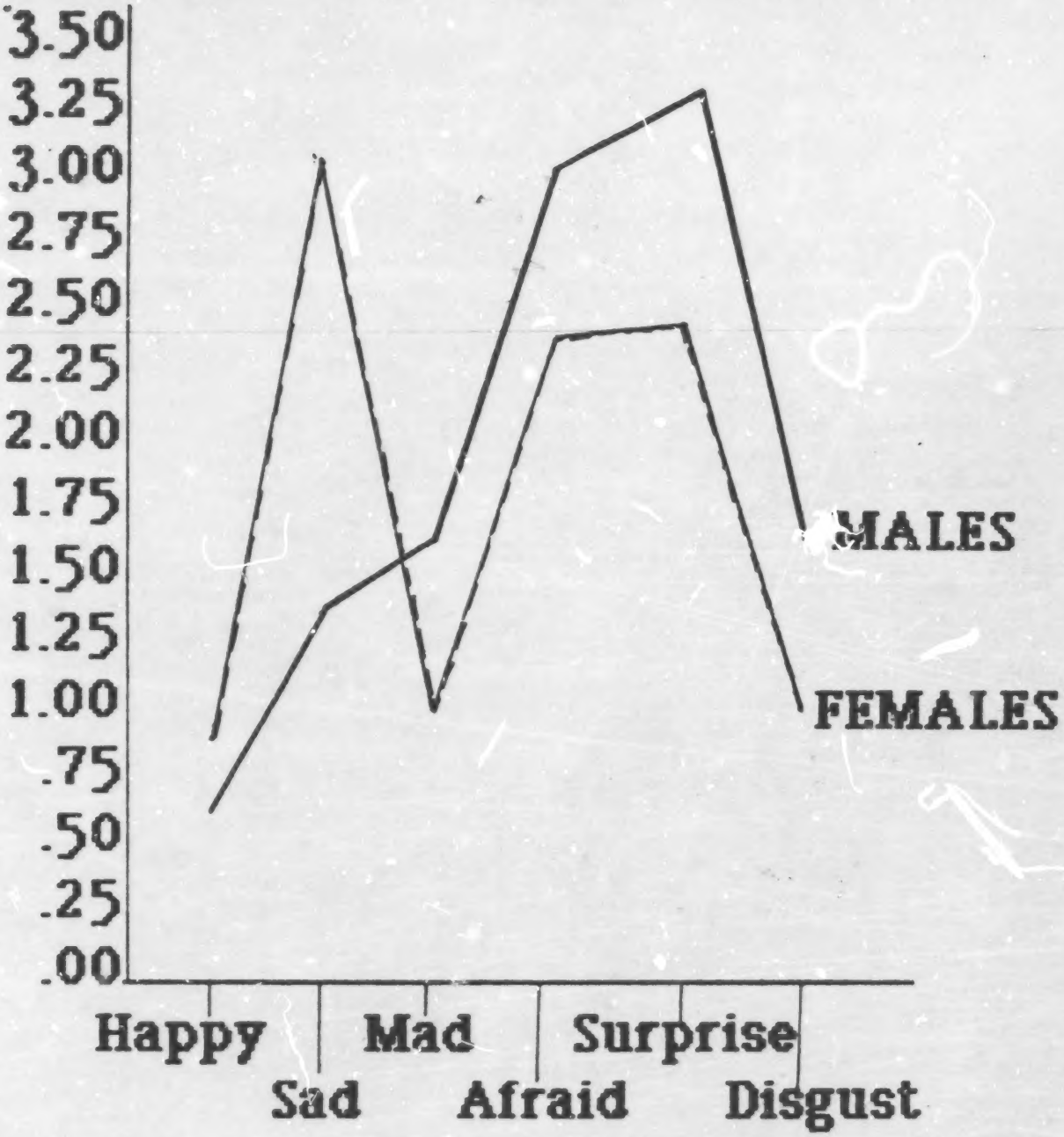

FIGURE 2

MEAN ERROR SCORES FOR MALES AND FEMALES IN GROUP 1.